CLAIMS

1. A receiver for use with a global navigation satellite system that transmits Alternate binary offset carrier, or AltBOC signals, the receiver including:
   A. a local composite code generator that produces a local version of an AltBOC composite code as combinations of locally produced real and imaginary code components;
   B. a correlation subsystem that produces correlation signals, the correlation subsystem correlating the locally produced composite code with the composite code in a received AltBOC signal by combining products produced by multiplying baseband inphase and quadrature components of the received signal by the locally produced real and imaginary composite code components;
   C. a controller that receives correlation signals from the correlation subsystem and adjusts the local composite code generator to align the local composite code with the corresponding composite code in the received AltBOC signal, the controller determining associated pseudoranges based on timing differences between the time the AltBOC composite code is transmitted and the time the code is received.

2. The receiver of claim 1 wherein the local composite code generator includes

   square wave code generators that produce real and imaginary components of upper and lower carriers,

   a first PRN code generator that produces a first code that is modulated on the upper carrier,

   a second PRN code generator that produces a second code that is modulated on the lower carrier, and

   adders and multipliers that multiply the first and second codes by the real and imaginary components of the upper and lower carriers and combine the products to produce the real and imaginary components of the local composite code.

3. The receiver of claim 2 wherein

the local code generator further produces combinations that correspond respectively to a sum and a difference of a first autocorrelation function that is associated with the first code and a second autocorrelation function that is associated with the second code,

the correlation system produces combination correlation signals that correspond to the respective combinations, and

the controller recovers data from the first and second codes in the received signal based on the combination correlation signals.

4. A local code generator for a receiver for use with a global navigation satellite system that transmits Alternate binary offset carrier, or AltBOC signals, the local code generator including:

A. a first code generator that produces a local version of a first code that is modulated on an upper carrier;

B. a second code generator that produces a local version of a second code that is modulated on a lower carrier;

C. a first square wave generator that produces a first square wave that corresponds to the respective real components of the upper and lower carriers;

D. a second square wave generator that produces a second square wave that corresponds to the respective imaginary components of the upper and lower carriers;

E. one or more adders that combine the first and second codes to produce associated sums; and

F. one or more multipliers that multiply the sums by the first and second square waves to produce real and imaginary components of the composite code.

5. The local code generator of claim 4 wherein the one or more adders include one or more inverters for selectively inverting the codes.

6. The local code generator of claim 5 wherein the code generated corresponds to a dataless composite pilot code.

7. The local code generator of claim 5 wherein the one or more multipliers further multiply each sum separately by the first and second square waves to produce real and imaginary components of respective associated combination correlation signals.

8. A method of determining global position from Alternate binary offset carrier, or AltBOC, signals received from a global navigation satellite system, the method including the steps of:

A. producing a local version of an AltBOC composite code as combinations of locally produced real and imaginary code components;

B. producing in-phase and quadrature components of the received AltBOC signal;

C. correlating the locally produced composite code with the composite code in the received AltBOC signal by combining products produced by multiplying the baseband inphase and quadrature components of the received AltBOC signal by the locally produced real and imaginary composite code components to produce associated correlation signals;

D. adjusting the local composite code generator based on the correlation signals to align the local composite code with the corresponding composite code in the received AltBOC signal; and

E. determining global position based on the timing differences between the local and the received AltBOC composite codes from at least three global navigation satellites.

9. The method of claim 8 wherein the step of producing the local version of the AltBOC composite code includes the steps of

producing square waves that correspond to real and imaginary components of upper and lower carriers,

producing a first code that is modulated on the upper carrier, producing a second code that is modulated on the lower carrier, and selectively combining the first and second codes and multiplying the results by the real and imaginary components of the upper and lower carriers.

10. The method of claim 8 wherein the step of selectively combining the first and second codes includes the steps of producing first and second sums that are associated respectively with the real and imaginary components, the first sum corresponding to the addition of the second code to an inverted first code and the second sum corresponding to the addition of the two codes.

11. The method of claim 9 further including the step of recovering data from the composite AltBOC codes by producing two combinations of the first and second codes and first and second square waves that correspond to real and imaginary components of $R_1 + R_2$ and $R_2 - R_1$, where R_k is the autocorrelation function for a signal k, and the associated values of the two combinations determine the values of corresponding data included in the first and second codes.